PRELIMINARY INFORMATION

650 Series Oscillator
Plug-in Unit

Model 655AKE, Serial No. 85

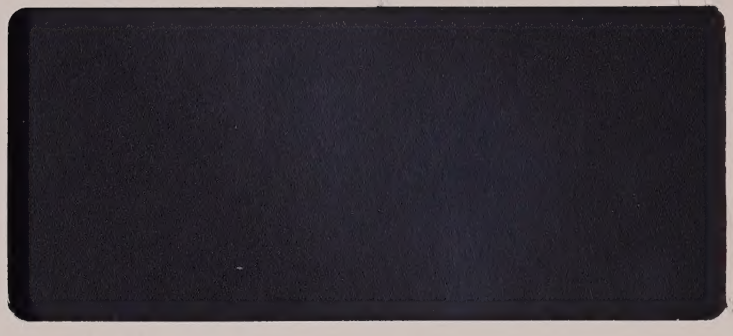
OFFICIAL RECORDS STATION
FILE COPY
FACILITIES

Lab # 535420

Job # 900818

P.O. A-685196-9914

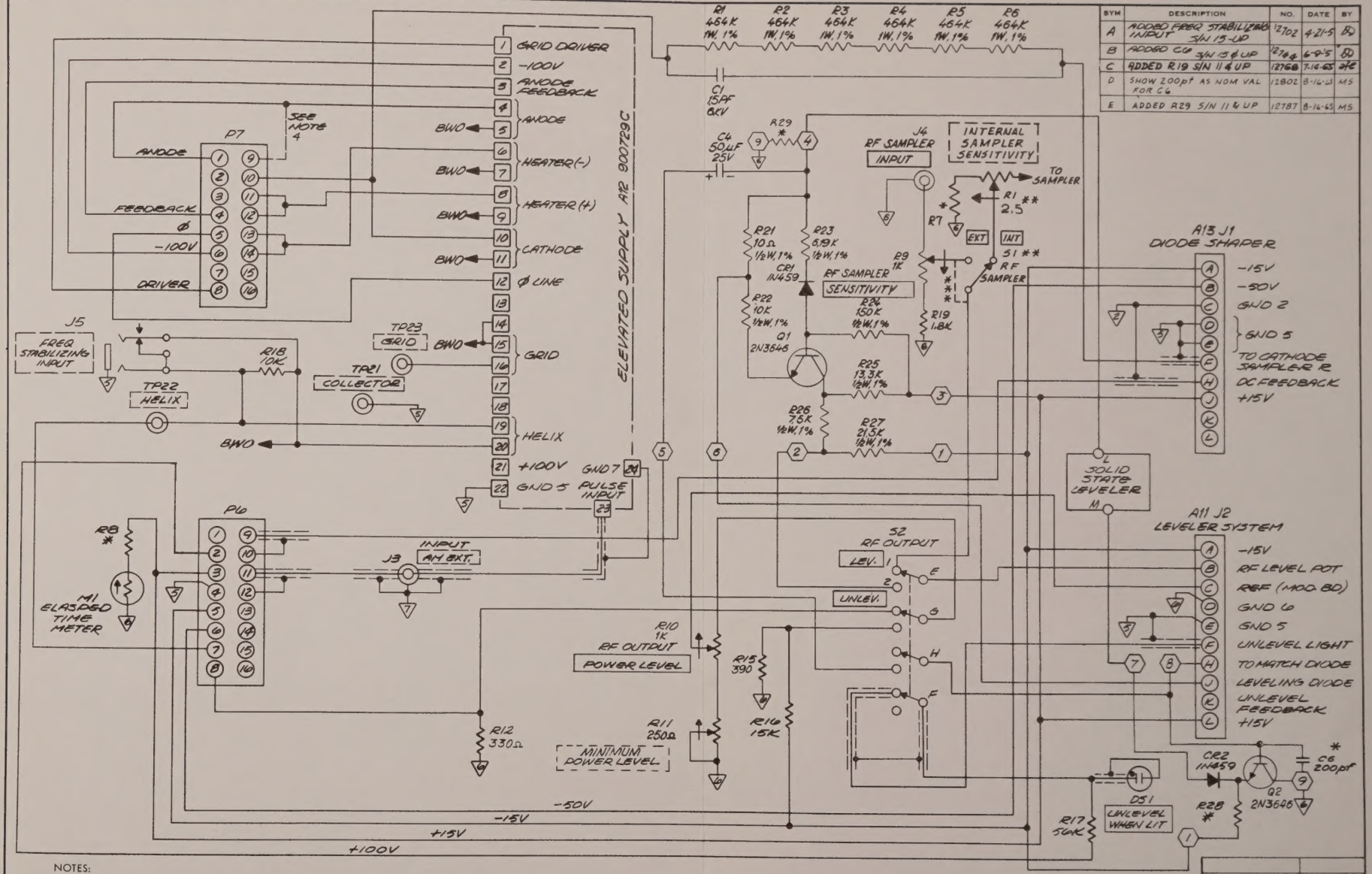
ALFRED ELECTRONICS 3176 PORTER DRIVE, PALO ALTO, CALIF.



PRELIMINARY INFORMATION

650 Series Oscillator
Plug-in Unit

Model 655AE, Serial No. 85



SYM	DESCRIPTION	NO.	DATE	BY
A	ADDED FREQ STABILIZING INPUT S/N 15-UP	12702	4-21-65	BD
B	ADDED C6 S/N 13 & UP	12764	6-9-65	BD
C	ADDED R19 S/N 11 & UP	12768	7-16-65	JHE
D	SHOW 200pf AS NOM VAL FOR C6	12802	8-16-65	MS
E	ADDED R29 S/N 11 & UP	12787	8-16-65	MS

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   1A. ALL RESISTORS IN OHMS, 1/2 W, 10%
   1B. ALL CAPACITORS IN MICROFARADS, 500 V
   1C. ALL 1% RESISTORS ARE METAL FILM
2. SQUARES (□) DESIGNATE TERMINAL CONNECTIONS ON PC BOARD "A12" ASSEMBLY NO. 950620.
3. HEXAGONS (⬡) DESIGNATE TERMINAL CONNECTIONS ON DIODE SWITCH DRIVER CIRCUIT PC BOARD, ASSEMBLY NUMBER 950887.
4. JUMPER FOR ANODE VOLTAGE GREATER THAN 100 VOLTS.
5. *OPTIONAL, REFER TO INSTRUCTION MANUAL.
6. **INCLUDED ONLY ON UNITS WITH INTERNAL RF SAMPLER (AK MODEL NUMBER SUFFIX).
7. ***CONNECTED ON UNITS WITHOUT INTERNAL RF SAMPLER.

ITEM	REQD	PART NO.	DESCRIPTION

LIST OF MATERIAL

3/N 15-UP	650AE	
NEXT ASSY	USED ON	

MATERIAL

MATERIAL STOCK NO.

FINISH OR TREATMENT

DRAWN — DATE 2-20-65

ENG

PROD

SCALE

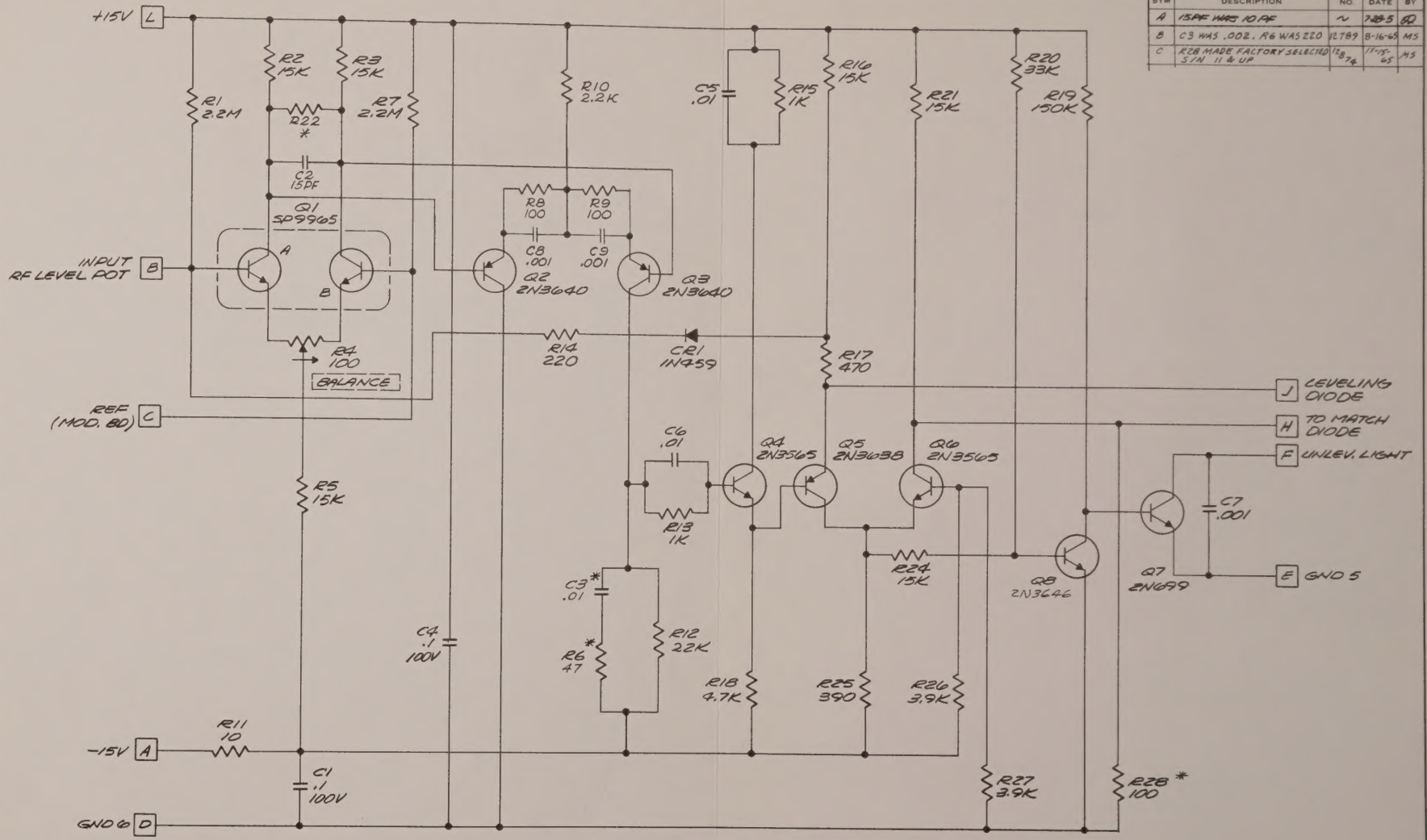
SCHEMATIC PLUG-IN SOLID STATE LEVELING

DIMENSIONS ARE IN INCHES
TOL: XX ± .015, XXX ± .005, ANGLE ± ½°
UNLESS INDICATED OTHERWISE

ALFRED ELECTRONICS
PALO ALTO, CALIFORNIA

900745C-1

SHEET 1 OF 1



SYM	DESCRIPTION	NO.	DATE	BY
A	15PF WAS 10 PF	~	7-28-5	GD
B	C3 WAS .002, R6 WAS 220	12789	8-16-65	MS
C	R28 MADE FACTORY SELECTED S/N 11 & UP	12874	11-15-65	MS

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   - 1A. ALL RESISTOR IN OHMS, 1/2W, 10 %
   - 1B. ALL CAPACITOR IN MICROFARADS, 500V
   - 1C. ALL RESISTOR 1% ARE METAL FILM
2. SQUARES (□) DESIGNATES TERMINAL CONNECTION ON ASSY "A11", ASSEMBLY NO. 950676

* FACTORY SELECTED VALUE

ITEM	REQD	PART NO.	DESCRIPTION
			LIST OF MATERIAL

		650A
	NEXT ASSY	USED ON

MATERIAL

MATERIAL STOCK NO.

FINISH OR TREATMENT

		DATE
DRAWN		2-8-65
ENG		3-8-65
PROD		3-1-65

SCALE

SCHEMATIC
SOLID STATE LEVELER
(SOLID-STATE)

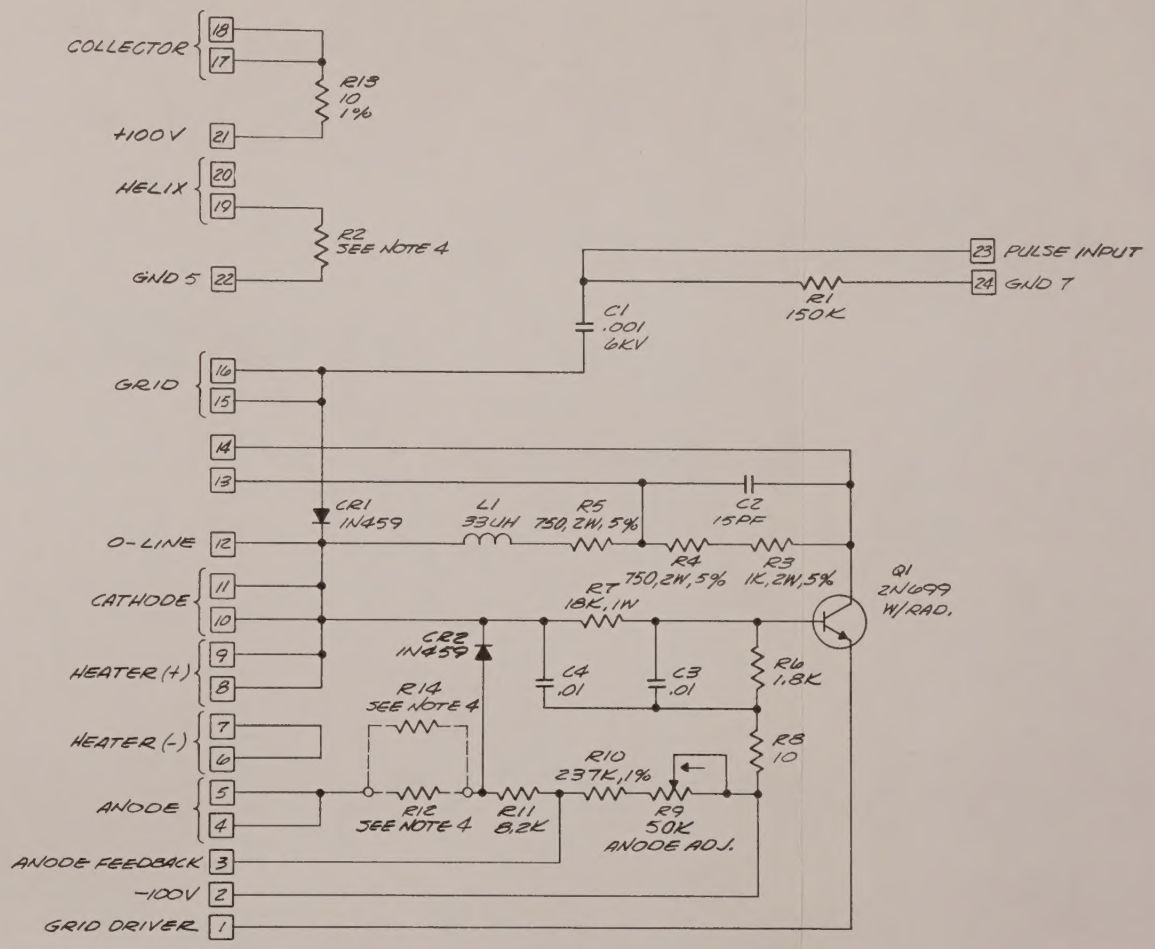
DIMENSIONS ARE IN INCHES
TOL: .XX ± .015, .XXX ± .005, ANGLE ± ½°
UNLESS INDICATED OTHERWISE

ALFRED ELECTRONICS
PALO ALTO, CALIFORNIA

900734C

SHEET 1 OF 1

SYM	DESCRIPTION	NO.	DATE	BY
A	BROKE CONNECTION BETWEEN 19 AND 20 SEE PLUG IN SCHEMATICS FOR APPLICABLE S.N.	12702	4-22-5	MN



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   - 1A. ALL RESISTOR IN OHMS, 1/2W, 10%
   - 1B. ALL RESISTORS VALUE 1% ARE METAL FILM
   - 1C. ALL CAPACITOR IN MICROFARADS, 500V
2. SQUARES (□) DESIGNATES TERMINAL CONNECTION ON ASSY "A12" ASSEMBLY NO. 950620
3. PREFIX REFERENCE DESIGNATORS BY "A12" (I.E.: A12R1, A12Q1)
4. REFER TO INSTRUCTION MANUAL

ITEM	REQD	PART NO.	DESCRIPTION

LIST OF MATERIAL

SER NO. 11-UP	650	
NEXT ASSY	USED ON	

MATERIAL

MATERIAL STOCK NO.

FINISH OR TREATMENT

DRAWN VK Itow	8-3-4	
ENG	1-4-65	
PROD	1-11-65	
SCALE		

SCHEMATIC ELEVATED SUPPLY

DIMENSIONS ARE IN INCHES
TOL: .XX ± .015, .XXX ± .005, ANGLE ± ½°
UNLESS INDICATED OTHERWISE

ALFRED ELECTRONICS
PALO ALTO, CALIFORNIA

900T29C

SHEET 1 OF 1

SYM	DESCRIPTION	NO.	DATE	BY
A	Q1 & Q2 REPLACED Q1A+Q1B S/N 30 & UP	12700	4-15-65	MN
B	SCHEMATIC ERROR R27 WAS SHOWN AS 1.5K	12772	7-14-65	JFC

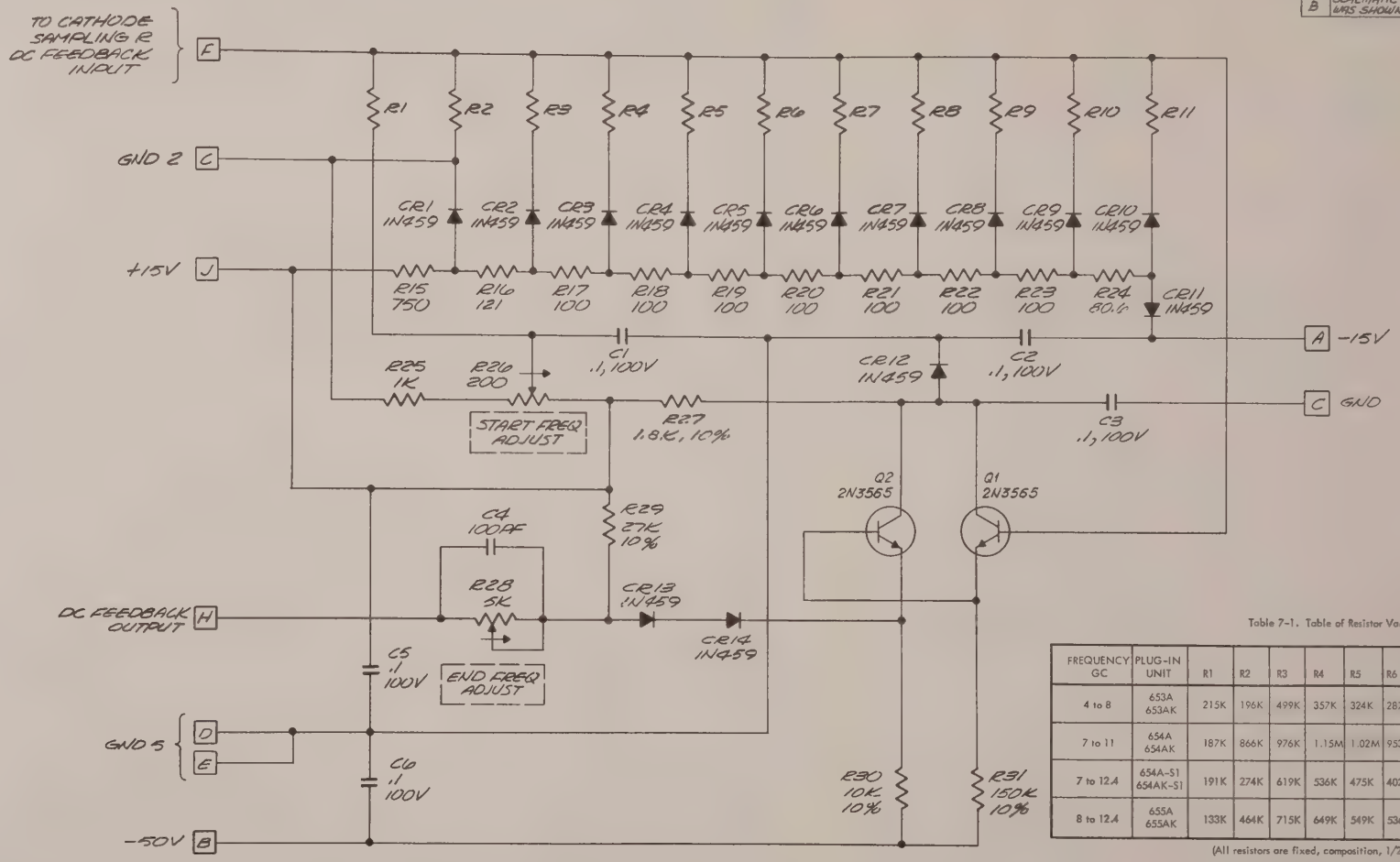


Table 7-1. Table of Resistor Values

FREQUENCY GC	PLUG-IN UNIT	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
4 to 8	653A 653AK	215K	196K	499K	357K	324K	287K	261K	215K	178K	143K	143K
7 to 11	654A 654AK	187K	866K	976K	1.15M	1.02M	953K	649K	698K	634K	576K	499K
7 to 12.4	654A-S1 654AK-S1	191K	274K	619K	536K	475K	402K	365K	316K	249K	249K	169K
8 to 12.4	655A 655AK	133K	464K	715K	649K	549K	536K	475K	392K	357K	294K	280K

(All resistors are fixed, composition, 1/2 w, 10%)

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   1A. ALL RESISTORS IN OHMS, ½W, 1% METAL FILM
   1B. ALL CAPACITORS IN MICROFARADS
2. REFER TO INSTRUCTION MANUAL FOR SPECIFIC VALUE OF R1 THRU R11 FOR THE PARTICULAR MODEL INVOLVED
3. SQUARES (□) DESIGNATE PRINTED CIRCUIT CONNECTION ON ASSY NO. 950---
4. PREFIX REFERENCE DESIGNATORS BY "A13" (I.E: A13R1, A13Q2)

Manual 650-4

ITEM	REQD	PART NO.	DESCRIPTION
			LIST OF MATERIAL

S/N 11-UP	650
NEXT ASSY	USED ON

MATERIAL

MATERIAL STOCK NO.

FINISH OR TREATMENT

		DATE
DRAWN	A. Stone	11-16-64
ENG.	Alan S. Hanna	1-4-65
PROD	N Kelsall	1-11-65

SCALE

SCHEMATIC DIODE SHAPER

DIMENSIONS ARE IN INCHES
TOL: .XX ± .015, .XXX ± .005, ANGLE ± ½°
UNLESS INDICATED OTHERWISE

ALFRED ELECTRONICS
PALO ALTO CALIFORNIA

900713C-4

SHEET 1 OF 1

ALFRED

Tube Warranty and Replacement Procedure

Tube Replacement

All TWT and BWO tubes furnished in ALFRED instruments are available from ALFRED ELECTRONICS or the tube manufacturer for either warranty or out-of-warranty replacements. Current prices are given on the Replacement Tube Price List.

Tube Warranty

On ALFRED supplied TWT and BWO tubes used in catalog instruments, ALFRED ELECTRONICS extends the full warranty given by the tube manufacturer current at the time of replacement and, in addition, offers the following minimum warranty:

> Tubes are warranted to meet specifications against defects in workmanship, materials and construction for a period of one year or a rated number of heater hours (Column A) whichever expires first. If a defect occurs during the warranty period, a prorated adjustment will be made based on the current list price of the tube and the percentage of rated heater hours (Column A) or the one year period, whichever results in lesser credit. If failure occurs within two months after shipment and within the unconditionally warranted heater hours (Column B) replacement will be made at no charge.

TWT

Mfg.	Power	A	B
Huggins	1 - 10 mw	2000	500
MEC	1 - 20 mw	2000	500
Huggins	1 watt	1000	250
MEC	1 watt	1500	500
MEC	1 - 10 watt	1000	500
Huggins	low NF, to 15 db	1500	250
MEC	low NF, to 15 db	1500	250
ITT	10 watt	500	50

BWO

Mfg.	Frequency	A	B
All	0.5 to 26.5 Gc	2500	250
Varian	26.5 to 40 Gc	1000	250

WARRANTY CONDITIONS APPLY ONLY TO TUBES LISTED ABOVE WHICH ARE USED IN ALFRED CATALOG INSTRUMENTS.

Return Authorization

TO OBTAIN WARRANTY CREDIT THE TUBE SERVICE REPORT MUST BE COMPLETED AND RETURNED WITH THE TUBE.

Return Procedure

In case of tube or instrument failure, please contact the factory or your local sales representative for advice or authorization to return either the tube or the instrument to the factory. NO TUBE OR INSTRUMENT WILL BE ACCEPTED FOR REPAIR OR CREDIT ADJUSTMENT WITHOUT WRITTEN AUTHORIZATION AND ACCOMPANYING SERVICE REPORT.

When the authorization is received, pack the tube in a rigid container (use original carton if available) at least 4" larger than the tube in each dimension. Wrap the tube with 1/4" of soft padding material and heavy kraft paper before placing in container. Pack at least 2" of resilient dunnage such as rubberized hair, foam, or similar shock absorbing material completely around the tube. Mark the container "FRAGILE" and ship PREPAID via air freight, air express or rail express. Do not ship via parcel post or air parcel post since experience has shown that fragile items are more apt to be damaged when shipped via these methods. At least 6" of rubberized hair (or equivalent shock absorbing material) is required for an instrument.

Repairable Tube

If the returned tube is found to be repairable, the user will be asked to issue a purchase order for repair charges determined by the original tube manufacturer. In general, the repair will be at no cost if the tube is in warranty and there is no evidence of misuse or abnormal conditions of operation.

In-Warranty Failure of BWO Tubes

If a BWO fails during the warranty period, please issue a purchase order for a new BWO tube at the tube list price and return the defective BWO tube. The defective tube will be examined by the tube manufacturer and if the failure is caused by tube malfunction, warranty credit will be issued. For warranty credit based on month of service, credit will be granted based on date when the defective tube is received at plant.

Warranty Credit

Any applicable credit allowed under the terms of this warranty applies only toward the future purchase of a replacement tube from ALFRED ELECTRONICS. Cash settlements will not be made. In terms of this warranty, a replacement tube must be the same type as that on which credit is allowed. Credit for one tube only may be applied toward the purchase of a single replacement tube. Warranty credit remains in effect for a maximum of six (6) months from date ALFRED ELECTRONICS notifies the customer. All credits will be based on the purchase price of the tube which prevails at the time the order for a replacement tube is received by ALFRED ELECTRONICS.

BWO RF Cables

RF OUTPUT CABLE MUST ACCOMPANY BWO TUBES returned for warranty credit, repair or replacement. If rf output cable is NOT returned, the cable price is added to the normal BWO repair or replacement charge. For prices see Replacement Tube Price List.

Special Conditions

If a returned tube or instrument proves not to be defective after test and evaluation at ALFRED ELECTRONICS, the tube or instrument will be returned at the customers' expense.

The final determination as to whether the tube failed in normal operation thereby bringing it under the applicable warranty or whether the tube was misused thereby excluding it from application of the warranty provisions, lies solely with the tube manufacturer.

Data, warranty credit, and prices subject to change without notice.

5-6-65

ALFRED ELECTRONICS

Service Report

Instrument Model _____ Serial No. _____ Date Received _____

TW/BWO Tube Type _____ Serial No. _____ Date Received _____

Date First Tested _____ Date Placed in Service _____ Date of Failure _____

Total Number of Hours of TWT/BWO Heater Operation _____

_____

1. Was operation normal just prior to failure? Yes _____ No _____

2. If not, what was done to adjust it? _____

_____

_____

3. Has proper cooling been maintained during tube operation? _____

_____

4. Did helix overcurrent tripout occur? _____

_____

5. Was environment normal? (specify) _____

_____

6. Symptoms - (describe failure) _____

_____

_____

7. Operating conditions at time of failure (indicate any unusual conditions) _____

_____

_____

8. Name of person to contact regarding evaluation of failure _____

Telephone No. _____ Signature _____

Title _____

Date _____

ALFRED

Tube Warranty and Replacement Procedure

Tube Replacement

All TWT and BWO tubes furnished in ALFRED instruments are available from ALFRED ELECTRONICS or the tube manufacturer for either warranty or out-of-warranty replacements. Current prices are given on the Replacement Tube Price List.

Tube Warranty

On ALFRED supplied TWT and BWO tubes used in catalog instruments, ALFRED ELECTRONICS extends the full warranty given by the tube manufacturer current at the time of replacement and, in addition, offers the following minimum warranty:

> Tubes are warranted to meet specifications against defects in workmanship, materials and construction for a period of one year or a rated number of heater hours (Column A) whichever expires first. If a defect occurs during the warranty period, a prorated adjustment will be made based on the current list price of the tube and the percentage of rated heater hours (Column A) or the one year period, whichever results in lesser credit. If failure occurs within two months after shipment and within the unconditionally warranted heater hours (Column B) replacement will be made at no charge.

TWT

Mfg.	Power	A	B
Huggins	1 - 10 mw	2000	500
MEC	1 - 20 mw	2000	500
Huggins	1 watt	1000	250
MEC	1 watt	1500	500
MEC	1 - 10 watt	1000	500
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BWO

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All	0.5 to 26.5 Gc	2500	250
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WARRANTY CONDITIONS APPLY ONLY TO TUBES LISTED ABOVE WHICH ARE USED IN ALFRED CATALOG INSTRUMENTS.

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TO OBTAIN WARRANTY CREDIT THE TUBE SERVICE REPORT MUST BE COMPLETED AND RETURNED WITH THE TUBE.

Return Procedure

In case of tube or instrument failure, please contact the factory or your local sales representative for advice or authorization to return either the tube or the instrument to the factory. NO TUBE OR INSTRUMENT WILL BE ACCEPTED FOR REPAIR OR CREDIT ADJUSTMENT WITHOUT WRITTEN AUTHORIZATION AND ACCOMPANYING SERVICE REPORT.

When the authorization is received, pack the tube in a rigid container (use original carton if available) at least 4" larger than the tube in each dimension. Wrap the tube with 1/4" of soft padding material and heavy kraft paper before placing in container. Pack at least 2" of resilient dunnage such as rubberized hair, foam, or similar shock absorbing material completely around the tube. Mark the container "FRAGILE" and ship PREPAID via air freight, air express or rail express. Do not ship via parcel post or air parcel post since experience has shown that fragile items are more apt to be damaged when shipped via these methods. At least 6" of rubberized hair (or equivalent shock absorbing material) is required for an instrument.

Repairable Tube

If the returned tube is found to be repairable, the user will be asked to issue a purchase order for repair charges determined by the original tube manufacturer. In general, the repair will be at no cost if the tube is in warranty and there is no evidence of misuse or abnormal conditions of operation.

In-Warranty Failure of BWO Tubes

If a BWO fails during the warranty period, please issue a purchase order for a new BWO tube at the tube list price and return the defective BWO tube. The defective tube will be examined by the tube manufacturer and if the failure is caused by tube malfunction, warranty credit will be issued. For warranty credit based on month of service, credit will be granted based on date when the defective tube is received at plant.

Warranty Credit

Any applicable credit allowed under the terms of this warranty applies only toward the future purchase of a replacement tube from ALFRED ELECTRONICS. Cash settlements will not be made. In terms of this warranty, a replacement tube must be the same type as that on which credit is allowed. Credit for one tube only may be applied toward the purchase of a single replacement tube. Warranty credit remains in effect for a maximum of six (6) months from date ALFRED ELECTRONICS notifies the customer. All credits will be based on the purchase price of the tube which prevails at the time the order for a replacement tube is received by ALFRED ELECTRONICS.

BWO RF Cables

RF OUTPUT CABLE MUST ACCOMPANY BWO TUBES returned for warranty credit, repair or replacement. If rf output cable is NOT returned, the cable price is added to the normal BWO repair or replacement charge. For prices see Replacement Tube Price List.

Special Conditions

If a returned tube or instrument proves not to be defective after test and evaluation at ALFRED ELECTRONICS, the tube or instrument will be returned at the customers' expense.

The final determination as to whether the tube failed in normal operation thereby bringing it under the applicable warranty or whether the tube was misused thereby excluding it from application of the warranty provisions, lies solely with the tube manufacturer.

Data, warranty credit, and prices subject to change without notice.

5-6-65

ALFRED ELECTRONICS

Service Report

Instrument Model _____ Serial No. _____ Date Received _____

TW/BWO Tube Type _____ Serial No. _____ Date Received _____

Date First Tested _____ Date Placed in Service _____ Date of Failure _____

Total Number of Hours of TWT/BWO Heater Operation _____

_____

1. Was operation normal just prior to failure? Yes _____ No _____

2. If not, what was done to adjust it? _____

_____

_____

3. Has proper cooling been maintained during tube operation? _____

_____

4. Did helix overcurrent tripout occur? _____

_____

5. Was environment normal? (specify) _____

_____

6. Symptoms - (describe failure) _____

_____

_____

7. Operating conditions at time of failure (indicate any unusual conditions) _____

_____

_____

8. Name of person to contact regarding evaluation of failure _____

Telephone No. _____ Signature _____

Title _____

Date _____

SHIPMENT DAMAGE CLAIM

The instrument should be tested as soon as it is received. If it fails to operate properly or is damaged in any way, a claim must be filed with the carrier. Have carrier agent inspect damage to instrument and packing crate and forward us a copy of his written report. You will then be advised of replacement or repair arrangements and disposition of the equipment. Please include model number, type number and serial number when referring to this instrument for any reason.

WARRANTY

ALFRED products are warranted against defects in workmanship and materials. This warranty is limited to repair or replacement of products or parts (except tubes, transistors, and batteries) which prove defective within one year after delivery to original purchaser. ALFRED ELECTRONICS is not liable for consequential damage.

If any fault develops:

1. Notify us, giving full details of the difficulty, including the model number, type number and serial number. Upon receipt of this information, you will be sent service instructions or shipping data.

2. Upon receipt of shipping instructions, forward the instrument prepaid and repairs will be made at the factory. If requested, an estimate of the charges will be made before the work begins when instrument is not covered by this warranty.

PACKING

The instrument should be packed in the original carton. If unusable or not available, use a wooden box with approximately three inches of excelsior or other shock-absorbing material surrounding the instrument. If desired, packing services of a local transfer and storage company may be employed.

THIS ENVELOPE CONTAINS:
ADDENDUM SHEETS
TEST DATA